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ABSTRACT

The National Council for Accreditation of Teacher Education (NCATE) requires that an institution keeps abreast of emerging evaluation techniques and engages in systematic efforts to evaluate the quality of its graduates. This empirical study illustrates how statistical analyses of data obtained from the inception of the "Alabama Initial Certification Test" (AICT) of 590 undergraduates at a state institution can be presented as supportive evidence in fulfilling the NCATE expectations. The Kruskal-Wallis One-Way Analysis of Variance procedure was selected as the test statistic to analyze the data obtained from each of the four AICT subtests based on the following four educational areas: (1) early childhood/elementary education; (2) secondary education; (3) special education; and (4) physical education. The Mann-Whitney U-Test was used to determine which groups differed from other groups. Results indicate significant differences in mean ranks of various groups across areas tested. (TJH)

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THE PRESENTATION OF STATISTICAL ANALYSIS OF

ALABAMA INITIAL CERTIFICATION TEST

DATA AS SUPPORTIVE EVIDENCE FOR NCATE ACCREDITATION

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ABSTRACT

NCATE requires that an institution "keeps abreast of emerging evaluation techniques and engages in systematic efforts to evaluate the quality of its graduates." This empirical study illustrates how statistical analyses of data obtained from the inception of the Alabama Initial Certification Test (AICT) of 590 undergraduates at a state institution can be presented as supportive evidence in fulfilling the aforesaid NCATE expectation.

The Kruskal-Wallis One-Way Analysis of Variance procedure was selected as the test statistic to analyze the data obtained from each of the four AICT subtests based on the following four educational areas: (1) Early Childhood/Elementary Education (ECE/EED), (2) Secondary Education (SED), (3) Special Education (SPE), (4) Physical Education (PE). When statistical significance was established, the Mann-Whitney U-Test was used as the follow-up procedure to determine which group or groups differed from the other groups. The significance of this study emphasizes the importance of using acceptable statistical methods demanded by national journals for publication before drawing conclusions regarding program strengths and weaknesses.

Several results were obtained from the aformentioned statistical procedures. At least one of mean ranks of Class B graduates on the (1) Humanistic and Behavioral Studies, (2) Curriculum and Instruction, (3) Evaluation, and (4) Policies, Organization and Legal Basis of Education subtests differed significantly from one or more of the mean ranks of their peers based on the aforesaid educational areas, $p < .05$. More specific findings are presented in the research paper. For example, the mean ranks of Class B graduates on the Humanistic and Behavioral Studies subtest for the ECE/EED, SED, and SPE majors were significantly higher than the mean ranks of PE majors, $p < .05$.

INTRODUCTION

Jacksonville State University systematically obtains data from various sources in order to evaluate the effectiveness of its undergraduate programs and to provide direction for necessary modifications and long range planning. The graduates are evaluated, the evaluation results are used to improve basic programs, and long-range planning is conducted, dependent to a considerable extent upon evaluation results.

6.1. Evaluation of Undergraduates

Standard: The institution keeps abreast of emerging evaluation techniques and engages in systematic efforts to evaluate the quality of its graduates upon completion of their programs of study and after they enter the teaching profession. This evaluation includes evidence of their performance in relation to program objectives.

Evaluation is accomplished by implementation of the following procedures. 1. Every faculty member is evaluated annually by his/her students. 2. Every faculty member is evaluated annually by his/her department head. 3. Deans and department heads are also evaluated by faculty members. 4.Undergraduates evaluate their program shortly before they complete graduation requirements. 5. Class B programs at Jacksonville State University are submitted for approval by the Alabama State Board of Education. This review process involves an intensive self-study that includes the College of Education faculty. 6. A self-study report is also submitted to the Southern Association of Colleges and Schools for evaluation. 7. The Jacksonville State University College of Education participated with numerous other state institutions of higher education in data collection and analyses by the Truman Pierce Institute for the Advancement of Teacher Education. 8. Additional investigations were conducted by the Jacksonville State University College of Education. A subcommittee was charged with the responsibility to gather and analyze data as part of the specific evaluation of undergraduate programs. The primary focus of this chapter deals with the review and results of the specific research conducted for undergraduate program modification purposes. This research was based upon data obtained from (1) questionnaires submitted to student teachers, graduates of Class B programs and their principals, and (2) the Alabama Initial Certification Test (AICT). Thus evaluation is an intricate and on-going part of the academic process at Jacksonville State University.

Test data obtained from the Alabama Initial Certification Test (AICT) were analyzed based on the following four educational areas as a comparison basis: (1) Early Childhood Education (ECE)/Elementary Education (EED) (2) Secondary Education (SED) (3) Special Education (SPE) (4) Physical Education (PE). The scores from the following AICT subtests were used: (1) Humanistic and Behavioral Studies (H & BS), (2) Curriculum and Instruction (C & I), (3) Evaluation (EVAL) and (4) Policies, Organization and Legal Basis of Education (PO & LBE). Evaluation of the four aforementioned educational areas was conducted to determine possible strengths and weaknesses within the Jacksonville State University College of Education undergraduate program in order to provide direction for long-range planning.

AICT Hypotheses Based on the Four Educational Areas for Class B Graduates

First, the following four null hypotheses were generated for the AICT subtest scores based on the aforesaid educational areas before conducting any statistical analyses.

Null Hypothesis I

The H & BS subtest scores of the four educational areas for Class B graduates will be the same.

Null Hypothesis II

The C & I subtest scores of the four educational areas for Class B graduates will be the same.

Null Hypothesis III

The EVAL subtest scores of the four educational areas for Class B graduates will be the same.

Null Hypothesis IV

The PO & LBE subtest scores of the four educational areas for Class B graduates will be the same.

It also is necessary to review the actual procedures used to statistically analyze these data. The data type used in this investigation is probably ordinal. Non-parametric statistics are appropriately used to analyze ordinal data as well as with groups having unequal numbers (i.e., varying in size) which was typical regarding the various groups based on educational areas of this study. Since statisticians have established that the Kruskal-Wallis One-Way Analysis of Variance procedure to be one of the best non-parametrics, it was selected as the test statistic to analyze the AICT data. (Ferguson, 1976) When the data provided evidence establishing statistical significance, the Mann-Whitney U-Test was used as the follow-up procedure to determine which group or groups differed from the other groups.

6.2. Evaluation of Results to Improve Basic Programs

Standard: The institution regularly evaluates its teacher education programs and uses the results of its evaluation in the modification and improvement of those programs.

AICT RESULTS

When the four null hypotheses constituting the basis for statistical analyses of the AICT subtest scores of Class B graduates for the four educational areas were tested, the following results were obtained.

Null Hypothesis I

Null hypothesis I is rejected with a 95% level of confidence. The mean ranks of Class B Graduates on the H & BS subtest for the ECE/EED, SED and SPE majors were significantly higher than the mean rank of PE majors. There were no significantly different mean ranks between the following educational areas: ECE/EED, SED and SPE.

Null Hypothesis II

There is sufficient evidence to reject null hypothesis II with a 95% level of confidence. The mean ranks of Class B graduates on the C & I subtest for ECE/EED and SED majors were significantly higher than the mean rank of the PE majors. The SPE majors' mean rank was not significantly higher than the mean rank of PE majors and there were no statistically significant differences indicated for the mean ranks of Class B graduates on this subtest among the following educational areas: ECE/EED, SED and SPE.

Null Hypothesis III

Null hypothesis III is rejected with a 95% level of confidence. The mean ranks of Class B graduates on the EVAL subtest for the ECE/EED, SED and SPE majors were statistically higher than the mean rank of PE majors. There were no significantly different mean ranks between ECE/EED, SED and SPE.

Null Hypothesis VI

Null hypothesis VI is rejected with a 95% level of confidence. The mean rank of Class B graduates on the PO & LBE subtest for the SED majors was significantly higher than the mean rank of PE majors. There were no significant differences detected between the mean ranks of either ECE/EED or SPE majors and the PE majors' mean rank. Finally, no significant differences were established between the following educational areas: ECE/EED, SED, and SPE.

DISCUSSION

Inferences derived from the statistical analyses of AICT subtest scores of Class B graduates for the four educational areas provided evidence that suggested Class B program strengths and weaknesses. Since only secondary education majors scored significantly higher on all four AICT subtests than their peers majoring in physical education, this finding is suggestive of the idea that SED undergraduate programs be viewed as a Class B strength. There is also some support for ECE/EED programs being viewed as a strength since early childhood/elementary education majors scored significantly higher than PE majors on three of the AICT subtests (i.e., H&BS, C&I, & EVAL). Physical education majors' performance was significantly lower than the other three educational programs on two AICT subtests (i.e., H&BS and EVAL). Why did physical education majors perform lower than Class B graduates of the other educational areas on several of the AICT subtests? JSU elementary and secondary education majors had statistically higher American College Test (ACT) scores than their physical education peers. Additionally, elementary and secondary majors at JSU had significantly higher Grade Point Averages (GPA's) than did their peers majoring in PE. Furthermore, there were no significant differences between GPA means of JSU elementary and secondary students and their peers majoring in special and early childhood education (Lindsey & Head, 1982). Conclusions that might be drawn include the following: (1) Many PE students, especially males, choose physical education as a teaching specialty in order to get into an athletic coaching career. Thus, by nature, they may not be as academically inclined as teachers in other fields, and the ACT and GPA's involve academic tasks. (2) Many of the physical education teacher's

responsibilities on the job do not involve academic tasks but the teaching of motor skills, team play, recreational games, and other tasks of similar nature at which the physical education teacher excels. The aforesaid findings and interpretations do not reflect negatively upon the PE program for the following reasons: (1) The Basic Professional Studies subtests being used for these comparisons were based upon courses taught by other College of Education faculty, not PE faculty. (2) On the Alabama State Certification Test in the teaching specialty of physical education, University students have exceeded the statewide passage rate thirteen times and had a lower percentage of students passing the test only twice. The University physical education students taking the test had a 100% passage rate seven times. Out of the total of 173 university students who have taken the physical education certification test since June 6, 1981 to December 14, 1985, 160 passed. Thus an appropriate interpretation might be that the JSU PE program is certainly adequate and even possibly outstanding when the results of the physical education area teaching field portion of the Alabama Teacher Certification Testing Program are reviewed (see Table 2).

TABLE 1
COMPARISON OF PERFORMANCE OF JSU STUDENTS AND STATEWIDE STUDENTS ALABAMA INITIAL CERTIFICATION TESTS1

Program	Number of Test Administrations Higher Percentage Passed By: JSU Students/	Statewide Students/Even		Comments
Early Childhood Ed.	11	4	0	ECE had lower percent passing only once since June 1982.
Elementary Education	9	6	0	Last time JSU had lower percent passing was December, 1983. JSU had 100% passage rate twice.
Physical Education	13	2	0	Has had 100% success rate 7 times. Only 15 of 184 students taking the test since 1981 have failed.
Emotionally Conflicted	8	6	1	Has had 100% success rate 6 times.
Hearing Impaired	2	0	0	
Mentally Retarded	9	6	0	Had 100% passage rate 1 time.
Art	3	2	0	Only two students in art have failed thetest.
Biology	4	6	0	Had 100% success rate 1 time.
Business & Office Ed.	10	3	0	Has had 100% success rate 10 times.
Chemistry				Only 3 students have failed. Nine have passed.
History	5	5	0	Has had 100% passage rate 7 times.2
Home Economics	4	6	1	Only 1 to 3 JSU students took the test each time, which can give misleading results.
Language Arts	8	5	2	Tied or exceeded passage rate of statewide students 10 times out of 15. On 6 of these tests, JSU had a 100% passage rate.
Library/Media	6	6	0	Has had 100% success rate 5 times. From 1 to 7 students have taken the test each time.
Mathematics	9	0	4	University mathematics students have had a 100% passage rate on everyoccasion but one. Only 1 JSU student has ever failed the tests during the 6 calender years the test has been required.
Music	11	2	1	Has had 100% passage rate 10 times.
Political Science				Only 1 student has ever failed the test. Ten have passed.
Psychology				Has had only 2 students to take the test. Both passed.
Science	6	4	0	Has had 100% passage rate 7 times.2
Social Science	5	3	1	Has had 100% passage rate 5 times.
Sociology				Only 3 students have taken the test. All 3 passed.
Speech/Communication & Theatre				Has had only three students to take the test, and all 3 passed.

1These data include both graduate and undergraduate results, as reported by the State Department, but the great majority of the student performances reflected are undergraduate

2 On some test administrations, the Alabama State Department made no comparison between university students and students statewide.

TABLE 2

ALABAMA TEACHER CERTIFICATION TESTING PROGRAM
PHYSICAL EDUCATION AREA

Number and Percentage Passed by JSU and State Wide Physical Education Majors

Testing Date	N	JSU Percentage	N	Statewide Percentage
6/6/81	1	100%	45	79%
8/22/81	4	80%	26	70%
12/12/81	10	100%	40	98%
3/20/82	6	100%	76	93%
6/26/82	10	91%	93	87%
12/11/82	20	100%	82	93%
3/26/83	15	100%	109	94%
6/25/83	11	85%	97	84%
12/10/83	13	87%	81	82%
3/24/84	11	92%	107	88%
6/23/84	17	94%	100	84%
12/8/84	12	80%	77	86%
3/23/85	10	83%	85	86%
6/22/85	8	100%	107	84%
12/14/85*	12	100%	68	99%
Median Percentage Passing from 6/6/81 to 12/14/85		94%		-- 86%

*no data was available for statewide performance on the physical education area exam after this date

Ferguson, George A. Statistical Analysis in Psychology and Education New York, N.Y.: McGraw-Hill, 1976.

Lindsey, Jimmy D. and Head, L. Quinn. A Comparison of Regular and Special Education Majors in a Teacher Education Program. Paper presented at the Annual Meeting of the Mid-South Educational Research Association, New Orleans, Louisiana, November 11, 1982.

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Presenters:

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